

## ***Interactive comment on “On the mesoscale monitoring capability of Argo floats in the Mediterranean Sea” by Antonio Sánchez-Román***

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Firstly, we wish to thank the reviewer for providing interesting and constructive comments to this paper.

Detailed response to comments of reviewer 2:

Reviewer comment: There is one major issue that the authors need to consider before the paper is published. The analysis procedure described in this paper is not a rigorous OSSE. Rigorous OSSE procedures have been developed in the meteorology community and are only recently being transitioned to the ocean. These comprehensive OSSE procedures have been developed to insure that the resulting impact assessments are credible and unbiased. A key step toward validating an OSSE system is given in Hoffman and Atlas (2016). The results contained in the present paper are interesting and

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should be published. It is too much to expect that the authors develop and validate a comprehensive OSSE system at this time. However, these results should be placed in context with regard to state-of-the-art OSSE systems that enable rigorous validation of results. Such rigorous validation is not possible with the approach used in this paper, which perhaps should be referred to as a "simplified OSSE approach". It therefore should be made clear that these results represent a first look that needs to be validated in the future with a comprehensive OSSE system.

Response: we thank the reviewer for drawing our attention to this point and for the suggested references. To develop and validate a comprehensive OSSE system we would need to sub-sample the Argo array in the Mediterranean Sea in order to have the corresponding OSE. Nonetheless, the low number of currently available Argo floats in the basin makes unfeasible a high-resolution study. For this reason, we have decided to define our approach as a "simplified OSSE approach" according to the suggestion of the reviewer. We have included in section 4 the following sentence to make clear that OSSEs conducted here do not follow the comprehensive procedure developed for the atmosphere and that the results reported need to be validated with a comprehensive OSSE system:

“As most of the ocean OSSEs conducted to date, OSSEs performed here do not follow the comprehensive design criteria and validation methodology developed for the atmosphere [Halliwell et al., 2014]. Rigorous OSSE procedure includes the validation against a corresponding OSE to guarantee the reliability of the outcomes of the OSSEs [Hoffmann and Atlas, 2016]. As a consequence, our approach can be qualified as simplified OSSE. Further validation will be needed in the future implementing a comprehensive OSSE system.”

The abstract and discussion have been also modified to include the approach followed and the need of a further validation through a comprehensive OSSE system.